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## RESULTS AND EXPERIENCES FROM THE SODI-COLLOID EXPERIMENT ON THE ISS

**Abstract**

E-USOC is the Spanish User Support and Operations Centre, one of the nine similar centres distributed at different locations in Europe. These centres perform the operations of European experiments on-board the International Space Station (ISS).

SODI is a facility built by the European industry that was launched on 28th August 2009 in Shuttle Discovery and mounted inside NASA's Microgravity Science GloveBox (MSG). By the beginning of year 2010 E-USOC started to work on the preparation and upgrade of the necessary products to operate the second experiment in the frame of the SODI payload, SODI-COLLOID, using the knowledge acquired in the previous SODI-IVIDIL experiment.

The SODI-COLLOID experiment studies the self-assembly of colloidal systems, by controlling the system temperature, in a reduced gravity environment. Researchers plan to characterize the nucleation and the early stages of aggregation studying the growth rate and size distribution over time.

COLLOID was installed in MSG by the NASA astronaut Shannon Walker on September 14rd, 2010. Between this date and October 5th 2010 the experiment was conducted from E-USOC premises, where operators monitored and controlled the facility. After a very successful execution, the preliminary results obtained in real time showed that unexpected phenomena occurred during the crystal growth and the aggregation phase. This led to the definition and later performance of a second set of runs in order to characterize those phenomena. The second COLLOID experiment execution took place between October 17rd, 2011 and November 3th, 2011.

A grand total of 46 scientific runs were successfully performed, generating 578739 scientific images and telemetry logs for around 538 hours of experiment. On November 4th 2011, Satoshi Furukawa (JAXA) removed the COLLOID experiment container from the MSG rack, concluding a very successful mission, for which a close coordination with the MSG team at NASA's POIC was required.

This paper will present a brief summary of the principles of the COLLOID experiment and its operation. Also, the work done by E-USOC in terms of preparation of procedures, displays, and setting up of the ground environment will be exposed. To conclude with outcomes of the mission, as well as lessons learned and conclusions.